

REMARKS

Claims 1, 5-19, and 21-26 are currently pending in the subject application, and are presently under consideration. Claims 1, 5-19, and 21-26 are rejected. Claim 17 is objected to due to an informality. Claims 1, 13, 17, 19, and 26 have been amended. Claims 7, 11, and 21-24 have been cancelled. Favorable reconsideration of the application is requested in view of the amendments and comments herein.

I. Objection to the Drawings

The drawings have been objected to for failing to show the specifics of the spreading code generator in FIG. 11. A revised FIG. 11 is provided in the attached replacement sheet, and paragraph 0050 has been amended to reflect the new drawing. It is thus respectfully requested that the objection be withdrawn.

II. Objection to Claim 17

Claim 17 was objected to due to an inconsistency with its base claims, specifically the recitation of a “spread signal” instead of the “spread input signal” recited in the base claims. Claim 17 has been amended to remove this informality, and the withdrawal of the objection to claim 17 is respectfully submitted.

III. Rejection of Claims 1, 5-12, 13-18, and 19-26 under 35 U.S.C. §112

Claims 1, 5-12, 13-18, and 19-26 have been rejected under 35 U.S.C. §112 as failing to comply with the enablement requirement. Claims 1 and 19 have been amended to remove the matter that was stated to be unsupported in the Office Action. Claims 13 and 26 have been amended to clarify that a spreading code is used, as requested in the Office Action. Claims 5-12, 14-18, and 20-25 are rejected solely for their reliance on rejected base claims. It is thus respectfully requested that the rejection of claims 1, 5-12, 13-18, and 19-26 under 35 U.S.C. §112 be withdrawn.

IV. Rejection of Claims 1, 2-7, 10-12, and 19-23 under 35 U.S.C. §103(a)

Claims 1, 5, 6, 10-12, 19, and 21 stand rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Patent No. 5,564,097 to Swanke ("Swanke") in view of U.S. Publication No. 2007/0041310 by Tulino ("Tulino"). Claims 7, 22, and 23 have been rejected as unpatentable over Swanke and Tulino in further view of U.S. Patent No. 5,966,646 to Lampe et al. ("Lampe"). Claim 1 has been amended to incorporate the subject matter of claim 7. Claim 19 has been amended to incorporate the subject matter of claim 22. Claims 7, 11, and 21-24 have been cancelled. Accordingly, the patentability of claims 5, 6, 10, 12, and 19 over Swanke, Tulino, and Lampe will be discussed herein. Support for the amendments to claims 1 and 19 can be found at least in FIG. 14 of the subject application and the accompanying text. Claims 1, 6, 10-12, and 19 also stand rejected as unpatentable over Tulino in view of U.S. Patent No. 6,289,038 to Park ("Park") and in further view of U.S. Patent No. 5,802,101 to Maruyama ("Maruyama").

A. Rejection over Swanke, Tulino, and Lampe

It is respectfully submitted that Swanke, Tulino, and Lampe, taken alone or in combination, fail to teach or suggest a transmitter system that spreads a signal, converts the digital spread signal from a first domain to a second domain, upconverts the converted signal, despreads the upconverted signal, and transmits the despread signal, as recited in claims 1 and 19. The Office Action states that it would be obvious to modify Swanke and Tulino based on Lampe to convert a signal to an intermediate frequency prior to spreading the signal, as to provide a double-conversion superheterodyne receiver. It is respectfully submitted, however, that upconverting a signal prior to spreading would not read on claims 1 and 19. To begin with, Swanke, Tulino, and Lampe all describe receiving systems, and thus cannot provide a teaching or suggestion of spreading a signal, modifying the spread signal, despreading the modified signal, and transmitting the despread signal. Ignoring this for the sake of discussion, even if one skilled in the art were motivated to create the proposed double-conversion superheterodyne receiver, nothing in the cited references would lead a skilled artisan to place mixer for frequency

conversion between the spreader and the despread in Swanke. Presumably, any such addition would be placed in the demodulator (FIG. 2, 226) that is already present in Swanke, which receives the despread signal. Accordingly, it is respectfully submitted that the combination of spreading a signal, frequency converting the spread signal, despread the frequency converted signal, and transmitting the despread signal would not be obvious to one skilled in the art in view of Swanke, Tulino, and Lampe.

Claims 5, 6, 10, and 12 each depend, directly or indirectly, from claim 1, and are allowable for at least the same reasons. Accordingly, claims 1, 5, 6, 10, 12, and 19 should be patentable over the Swanke, Tulino, and Lampe, and withdrawal of this rejection is respectfully requested.

B. Rejection over Tulino, Park, and Maruyama

It is respectfully submitted that Tulino, Park, and Maruyama, taken alone or in combination, fail to teach or suggest a transmitter system that spreads a signal, converts the digital spread signal from a first domain to a second domain, upconverts the converted signal, despreads the upconverted signal, and transmits the despread signal, as recited in claims 1 and 19. The Office Action depends on Maruyama for a teaching of spreading and upconverting a signal, but claims 1 and 19, as amended, recite despread the signal prior to transmission. It is respectfully submitted that, as taught in Maruyama, transmitting a signal as a spread spectrum signal is known in the art, as, generally speaking, spread spectrum signals enjoy advantages in mitigate the effects of interference and other noise sources. Spreading the signal solely for the purpose of an upconversion process and then despread the signal prior to transmission is contrary to conventional practice, and it is respectfully submitted that Maruyama, even read in light of Tulino and Park, would not lead one skilled in the art to the system and method of claims 1 and 19. It is thus respectfully submitted that claims 1 and 19 should be allowable over Tulino, Park, and Maruyama.

Claims 6, 10, and 12 each depend, directly or indirectly, from claims 1, and are allowable for at least the same reasons. Accordingly, claims 1, 6, 10, 12, and 19 should be patentable over the Swanke, Tulino, and Lampe, and withdrawal of this rejection is respectfully requested.

V. Rejection of Claims 8, 9, 13-16, 25, and 26 under 35 U.S.C. §103(a)

Claims 8, 9, 13-16, 25, and 26 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Swanke and Tulino in further view of U.S. Publication No. 2002/0160732 to Panasik, et al. ("Panasik"). Claims 8, 13-16, 25, and 26 also stand rejected as unpatentable over Tulino, Park, and Maruyama in view of Panasik. It is respectfully submitted that one skilled in the art would not be lead to incorporate the clipping mechanism of Panasik into the proposed combination of Swanke and Tulino absent the teachings of the subject application.

Claim 13 recites a signal conversion system. A spreading code generator produces a direct sequence spread spectrum (DS-SS) spreading code. A spreading circuit receives an input signal and combines the input signal with the DS-SS spreading code to provide a spread input signal. A clipping component reduces peaks associated with the spread input signal. A despreading circuit despreads the peak reduced spread input signal. Claim 26 recites at least the limitations of claim 13, in means plus function form.

The most recent Office Action notes that neither Swanke in view of Tulino nor Tulino in view of Park and Maruyama teach the recited clipping component, and relies on Panasik to provide a clipping component implemented upstream of an analog-to-digital converter. The rationale for this combination has been changed, however, to the assertion that one skilled in the art would be motivated to include the entire sigma-delta ADC of Panasik to reduce quantization error, and would also include the clipping component of Panasik to reduce peaks associated with the spread input signal as to avoid overshoot and settling in the sigma-delta ADC.

It is respectfully submitted, however, that one skilled in the art would not seek to utilize a sigma-delta ADC with a spectrum spreading arrangement as proposed in the Office Action. For example, the spread approach applied in Swanke varies the frequency in which the spreading injection is varied at a rate faster than the bandwidth of the desired signal, requiring

oversampling of the signal. This effectively spreads the interference throughout the expanded bandwidth of the signal, such that it will not corrupt more than one spreading state of the signal. See Swanke, Col. 3, lines 24-45. Direct spreading schemes, such as those taught in Maruyama, also operate to spread the effect of spurious signals across a wider bandwidth. Sigma-delta ADCs redistribute signal error across an expanded bandwidth in a similar manner, and it is respectfully submitted that the application of the sigma-delta modulation in addition to the spread signal would provide minimal gains. It is thus respectfully submitted that one skilled in the art would not seek to spread a signal, convert the signal at a sigma-delta ADC, and despread the signal as proposed in the Office Action. Since there is no reason for one of skill in the art to incorporate the sigma-delta ADC into the proposed combinations of Swanke in view of Tulino and Tulino in view of Park and Maruyama, one skilled in the art would not be lead to incorporate the clipping component to avoid overshoot and settling in the sigma-delta ADC as suggested in the Office Action. It is thus respectfully submitted that claims 13 and 26 define patentable invention over the cited art.

Claims 14-16 depend from claim 13 and should be allowable for at least the same reasons. Claims 8 and 9 depend from claim 1, and claim 25 depends from claim 19. Panasik does not remedy the deficiencies of Swanke and Tulino as set forth above in the discussion of claims 1 and 19. Claims 8, 9 and 25 should thus be allowable for at least the reasons provided for their respective base claims as well as for the reasoning provided for claims 13 and 26 above. It is thus respectfully submitted that claims 9, 13-16, 25, and 26 define over the cited art, and the withdrawal of this rejection is respectfully submitted.

VI Rejection of Claim 17 under 35 U.S.C. §103(a)

Claim 17 has been rejected as unpatentable over Swanke, Tulino, and Panasik in further view of U.S. Patent No. 6,873,281 to Esterberg et al. (“Esterberg”), as well as . Claim 17 depends, indirectly, from claim 13, and is allowable for at least the same reasons. Esterberg does not remedy the deficiencies of either the proposed combination of Swanke, Tulino, and Panasik or the proposed combination of Tulino, Park, Maruyama, and Panasik with respect to claim 13,

as described above. It is thus respectfully submitted that claim 17 defines over the cited art, and the withdrawal of this rejection is respectfully submitted.

VII Rejection of Claim 18 under 35 U.S.C. §103(a)

Claim 18 has been rejected as unpatentable over Swanke, Tulino, and Panasik in further view of Lampe. Claim 18 has also been rejected as unpatentable over Tulino, Park, and Maruyama in further view of Panasik. Claim 18 depends, indirectly, from claim 13, and is allowable for at least the same reasons. Lampe does not remedy the deficiencies of Swanke, Tulino, and Panasik with respect to claim 13, as described above. Similarly, Panasik does not remedy the deficiencies of Tulino, Park, and Maruyama with respect to claim 13, as described above. It is thus respectfully submitted that claim 18 defines over the cited art, and the withdrawal of this rejection is respectfully submitted.

VIII. Rejection of Claim 24 under 35 U.S.C. §103(a)

Claim 24 stands rejected under 35 U.S.C. §103(a) as being unpatentable over Swanke and Tulino in further view of Maruyama. Claim 24 has been cancelled, and withdrawal of this rejection is respectfully requested.

CONCLUSION

In view of the foregoing remarks, Applicants respectfully submit that the present application is in condition for allowance. Applicants respectfully request reconsideration of this application and that the application be passed to issue.

Please charge any deficiency or credit any overpayment in the fees for this amendment to our Deposit Account No. 20-0090.

Respectfully submitted,

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